whereby at least one exposed surface of the workpiece dries in a drying time interval whose length lies in a range of 1-60 seconds.

2. The method of claim 1, further comprising the step of choosing said second liquid from the class consisting of hydrofluoroether, an azeotrope of hydrofluoroether, an ethylated hydrofluoroether and an azeotrope of an ethylated hydrofluoroether, maintained at a selected temperature in the range 10-80 ^{o}C.

3. The method of claim 1, wherein said step of transferring said drying liquid to said exposed surface of said workpiece comprises spraying said second liquid onto a selected portion of said exposed surface of said workpiece.

4. The method of claim 3, wherein said step of transferring said second liquid to said at least one exposed surface of said workpiece comprises the steps of:

directing a sheet of said second liquid in a selected direction toward said at least one exposed surface of said workpiece so that a selected region, having a selected orientation relative to a vertical direction, of said at least one exposed surface is wetted by the sheet of said second liquid; and

moving at least one of said workpiece and the sheet of said second liquid so that substantially all regions of said at least one exposed surface of said workpiece are wetted by the sheet of said second liquid.

5. The method of claim 4, further comprising the step of choosing said selected orientation of said selected region from a class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation.

6. The method of claim 4, further comprising the steps of:

directing a second sheet of said second liquid in a selected direction toward said a second exposed surface of said workpiece so that a second selected region,

having a second selected orientation relative to a vertical direction, of the second exposed surface is wetted by the second sheet of said second liquid; and

moving at least one of said workpiece and the second sheet of said second liquid so that substantially all regions of the second exposed surface of said workpiece are wetted by the second sheet of said second liquid.

7. The method of claim 6, further comprising the steps of:

choosing said first selected orientation of said selected region from a first class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation; and

choosing said second selected orientation of said second selected region from a second class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation.

8. The method of claim 4, further comprising the step of rotating said selected direction of said sheet of said second liquid relative to said workpiece so that substantially all regions of said at least one exposed surface of said workpiece are wetted by said sheet of said second liquid.

9. The method of claim 1, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises dribbling said second liquid onto a selected region of said exposed surface of said workpiece.

10. The method of claim 1, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

spraying said second liquid in a sheet onto a selected portion of said exposed surface as said exposed surface rotates.

11. The method of claim 1, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

spraying said second liquid in at least a first sheet and a second sheet onto a selected portion of said exposed surface as said exposed surface rotates.

12. The method of claim 1, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

directing a stream of said second liquid onto a selected portion of said exposed surface as said exposed surface rotates.

13. The method of claim 1, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface;

immersing said exposed surface in said second liquid for a selected processing time interval whose length lies in a range of 5-60 seconds; and

removing said exposed surface from said second liquid.

14. A method for cleaning a workpiece, the method comprising the steps of:

transferring to least one exposed surface of the workpiece a processing liquid, where the processing liquid has a surface tension that is less than 17 dynes/cm and has a liquid density that is much greater than the density of water;

whereby contaminants on at least one exposed surface of the workpiece are removed from the at least one exposed surface.

15. The method of claim 14, further comprising the step of choosing said processing liquid from the class consisting of hydrofluoroether, an azeotrope of hydrofluoroether, an ethylated hydrofluoroether and an azeotrope of an ethylated hydrofluoroether, maintained at a selected temperature in the range 20-60 ^{o}C.

16. The method of claim 14, wherein said step of transferring said liquid to said exposed surface of said workpiece comprises spraying said liquid onto a selected portion of said exposed surface of said workpiece.

17. The method of claim 14, wherein said step of transferring said liquid to said at least one exposed surface of said workpiece comprises the steps of:

directing a sheet of said liquid in a selected direction toward said at least one exposed surface of said workpiece so that a selected region, having a selected orientation relative to a vertical direction, of said at least one exposed surface is wetted by the sheet of said liquid; and

moving at least one of said workpiece and the sheet of said liquid so that substantially all regions of said at least one exposed surface of said workpiece are wetted by the sheet of said liquid.

18. The method of claim 17, further comprising the step of choosing said selected orientation of said selected region from a class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation.

19. The method of claim 17, further comprising the steps of:

directing a second sheet of said second liquid in a selected direction toward said a second exposed surface of said workpiece so that a second selected region, having a second selected orientation relative to a vertical direction, of the second exposed surface is wetted by the second sheet of said second liquid; and

moving at least one of said workpiece and the second sheet of said second liquid so that substantially all regions of the second exposed surface of said workpiece are wetted by the second sheet of said second liquid.

20. The method of claim 19, further comprising the steps of:

choosing said first selected orientation of said selected region from a first class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation; and

choosing said second selected orientation of said second selected region from a second class of orientations consisting of vertical orientation, horizontal orientation and diagonal orientation.

21. The method of claim 17, further comprising the step of rotating said selected direction of said sheet of said liquid relative to said workpiece so that substantially all regions of said at least one exposed surface of said workpiece are wetted by said sheet of said liquid.

22. The method of claim 14, wherein said step of transferring said processing liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

spraying said processing liquid in a sheet onto a selected portion of said exposed surface as said exposed surface rotates.

23. The method of claim 14, wherein said step of transferring said processing liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

spraying said processing liquid in at least a first sheet and a second sheet onto a selected portion of said exposed surface as said exposed surface rotates.

24. The method of claim 14, wherein said step of transferring said processing liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface;

spraying said processing liquid in a sheet onto a first selected portion of said exposed surface as said exposed surface rotates; and

spraying a second processing liquid in a sheet onto a second selected portion of said exposed surface as said exposed surface rotates, where the second processing liquid has a surface tension that is less than 17 dynes/cm, has a liquid density that is much greater than the density of water and is different from said first processing liquid.

25. The method of claim 14, wherein said step of transferring said processing liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface; and

directing a stream of said processing liquid onto a selected portion of said exposed surface as said exposed surface rotates.

26. The method of claim 14, wherein said step of transferring said second liquid to said exposed surface of said workpiece comprises:

rotating said exposed surface at a selected angular velocity about a selected rotation axis that passes through said exposed surface;

immersing said exposed surface in said second liquid for a selected processing time interval whose length lies in a range of 5-60 seconds; and

removing said exposed surface from said second liquid.

*27 (new). A method for drying a workpiece, the method comprising the steps of:

immersing the workpiece in a selected processing liquid, where the liquid has a surface tension that is less than 17 dynes/cm, and has a liquid density that is much greater than the density of water;

32 31

forming a selected flow pattern of the liquid that is approximately circular across at least a portion of at least one exposed surface of the workpiece, for a selected time interval; and

removing the workpiece from the liquid,

whereby the at least a portion of the at least one exposed surface of the workpiece dries within 45 seconds after being removed from the liquid.

*28 (new). The method of claim 27, further comprising the step of choosing said liquid from the class consisting of hydrofluoroether and an azeotrope of hydrofluoroether, maintained at a selected temperature in the range 20-60 ^{o}C.

*29 (new). The method of claim 27, further comprising the step of choosing said flow pattern to have an approximate center for said approximately circular flow that is spaced apart from said workpiece.

*30 (new). The method of claim 27, further comprising the step of choosing said flow pattern to have an approximate center for said approximately circular flow that is located within said at least one portion of said at least one exposed surface of said workpiece.

*31 (new). The method of claim 28, further comprising the step of forming said approximately circular flow pattern with an associated liquid angular velocity in the range 0.2-500 radians per second.

*32 (new). The method of claim 31, further comprising the step of forming a second selected flow pattern of said liquid that is approximately circular across at least a second portion of said at least one exposed surface of said workpiece, for a second selected time interval, where said first portion and

the second portion of said at least one exposed surface of said workpiece overlap each other.

*33 (new). A method for cleaning a workpiece, the method comprising the steps of:

immersing the workpiece in a selected processing liquid, where the liquid has a surface tension that is less than 17 dynes/cm, and has a liquid density that is much greater than the density of water;

forming a selected flow pattern of the liquid that is approximately circular across at least a portion of at least one exposed surface of the workpiece, for a selected time interval; and

removing the workpiece from the liquid,

whereby contaminants are removed from the at least one exposed surface.

*34 (new). The method of claim 33, further comprising the step of choosing said liquid from the class consisting of hydrofluoroether and an azeotrope of hydrofluoroether, maintained at a selected temperature in the range 20-60 ^{o}C.

*35 (new). The method of claim 33, further comprising the step of choosing said flow pattern to have an approximate center for said approximately circular flow that is spaced apart from said workpiece.

*36 (new). The method of claim 33, further comprising the step of choosing said flow pattern to have an approximate center for said approximately circular flow that is located within said at least one portion of said at least one exposed surface of said workpiece.

*37 (new). The method of claim 36, further comprising the step of forming said approximately circular flow pattern with an associated liquid angular velocity in the range 0.2-500 radians per second.

34 33

*38 (new). The method of claim 33, further comprising the step of forming a second selected flow pattern of said liquid that is approximately circular across at least a second portion of said at least one exposed surface of said workpiece, for a second selected time interval, where said first portion and the second portion of said at least one exposed surface of said workpiece overlap each other.

*39 (new). A method for drying a workpiece, the method comprising the steps of:

immersing the workpiece in a selected processing liquid that has a surface tension that is less than 17 dynes/cm and that has a liquid density that is much greater than the density of water, where the liquid is heated to a selected temperature that is less than the boiling temperature of the liquid, for a selected immersion time interval of at least 5 seconds;

subjecting the workpiece to ultrasonic vibrations in a selected frequency range within the liquid for at least a portion of the immersion time interval; and

withdrawing the workpiece from the liquid at a selected withdrawal rate,

whereby an exposed surface of the workpiece dries after the workpiece surface is withdrawn from the liquid in a drying time interval whose length does not exceed 30 seconds.

*40 (new). The method of claim 39, further comprising the step of choosing said liquid from the class consisting of hydrofluoroether and an azeotrope of hydrofluoroether, maintained at a selected temperature in the range 20-60 ^{o}C.

*41 (new). The method of claim 39, further comprising the steps of:

maintaining said liquid at a selected temperature in the range of 30-60 ^{o}C; and

withdrawing said workpiece from said liquid at a withdrawal rate in the range of 0.5-5 cm/sec.

*42 (new). A method for cleaning a workpiece, the method comprising the steps of:

immersing the workpiece in a selected processing liquid that has a surface tension that is less than 17 dynes/cm and that has a liquid density that is much greater than the density of water, where the liquid is heated to a selected temperature that is less than the boiling temperature of the liquid, for a selected immersion time interval of at least 5 seconds;

subjecting the workpiece to ultrasonic vibrations in a selected frequency range within the liquid for at least a portion of the immersion time interval; and

withdrawing the workpiece from the liquid at a selected withdrawal rate,

whereby contaminants on at least one exposed surface of the workpiece are removed.

*43 (new). The method of claim 42, further comprising the step of choosing said liquid from the class consisting of hydrofluoroether and an azeotrope of hydrofluoroether, maintained at a selected temperature in the range 20-60 ^{o}C.

*44 (new). The method of claim 43, further comprising the steps of:

maintaining said liquid at a selected temperature in the range of 30-60 ^{o}C; and

withdrawing said workpiece from said first liquid at a withdrawal rate in the range of 0.5-5 cm/sec.